

Marine Vessels and Air Quality Strategies for Meeting Environmental Requirements

Local Control of Global Sources

February 1, 2001

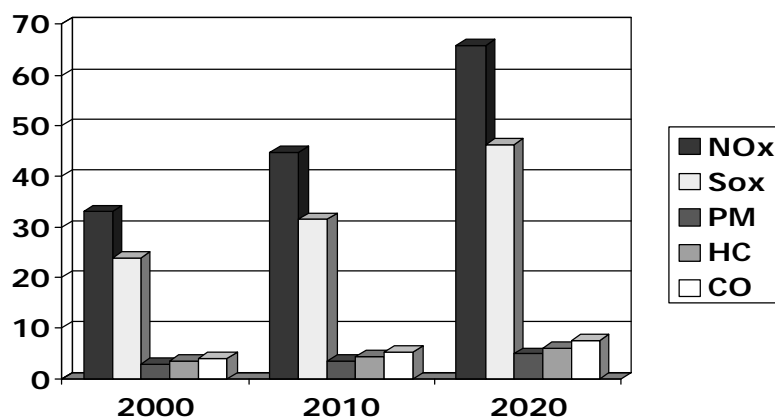
T.L. Garrett
City of Los Angeles



History in South Coast

- 1993 - EPA Federal Implementation Plan
- 1994 - Marine Vessel Control Measure M13
- 1995 - SCAQMD Marine Emission Inventory
- 1996 - EPA Marine Consultative Process
- 1998 - CARB Vessel Technical Working Group

Marine Vessel Emissions (ton/day)



Inventory Strengths

- Ship Specific Activity Data
 - Ship Speed
 - Time in Mode
 - Engine Specific Data
- Improved Emissions Factors

Inventory Weaknesses

- Emission Factors for Marine Vessels
- Sulfur Content of Marine Fuels
- Operational Information
- Other Categories

Ship Emissions



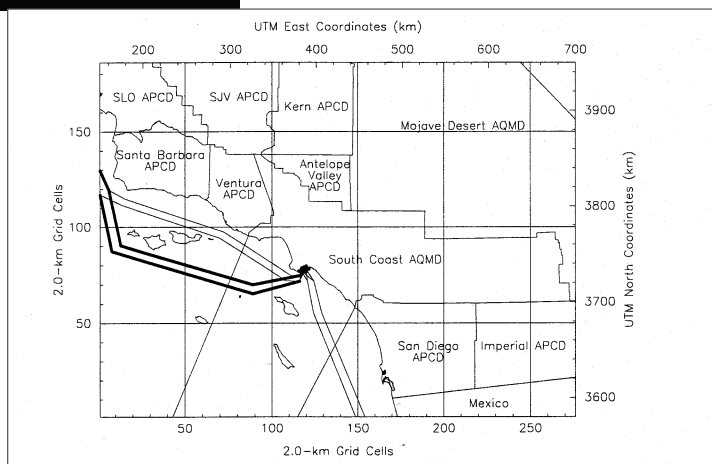
Marine Vessel Control Measure M13

- **IMO Standards - 1998**
- **EPA National Standards - 1999**
- **Operational Controls (Voluntary)**
 - Relocated Shipping Channel
 - Vessel Speed Reductions

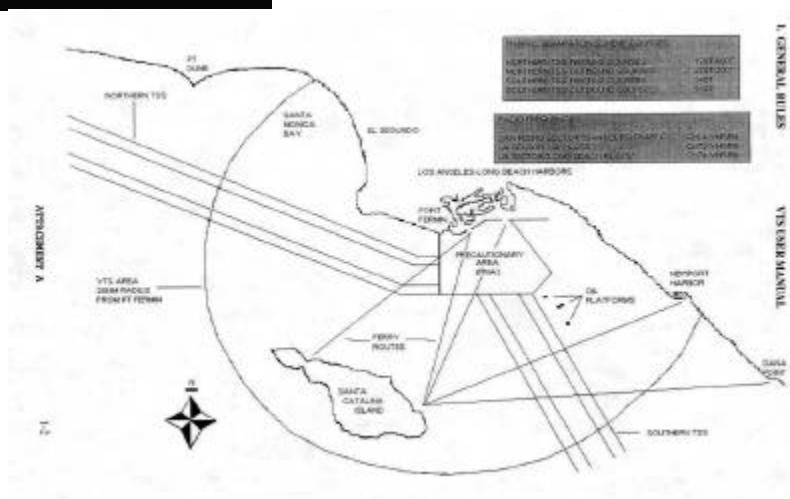
Operational Controls



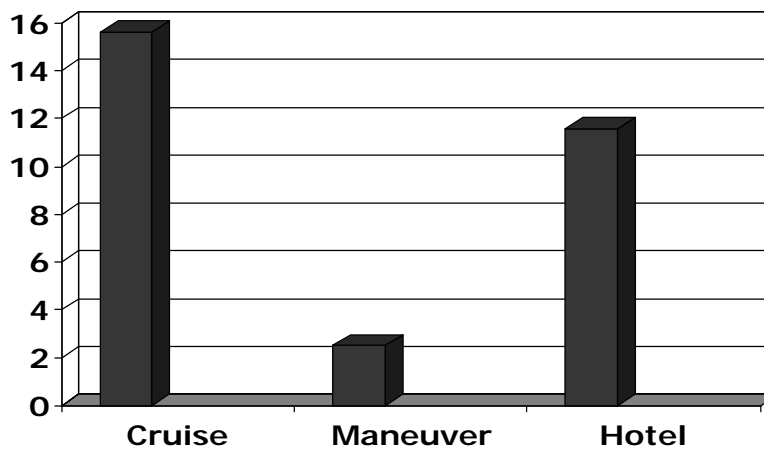
Existing and Proposed Shipping Channels



Speed Reductions



Vessel Emissions by Mode (NO_x-ton/day)



Ship Hotelling



Tugs



Line Haul Locomotives



Switch Engines



Trucks



Clean Fuel Yard Equipment



Electrification of On-Dock Equipment



Zero Emission Vessel

